



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,582	03/07/2006	Christoph Brabec	21928-019US1	6468
26161	7590	12/14/2007		
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER PATEL, REEMA	
			ART UNIT 2812	PAPER NUMBER
			MAIL DATE 12/14/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/561,582

Applicant(s)

BRABEC ET AL.

Examiner

Reema Patel

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to an amendment filed 8/27/07.

Drawings

1. The drawings were received on 8/27/07. These drawings are acceptable.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Petritsch et al. (U.S. 6,340,789 B1).
4. Regarding claims 1-2, Petritsch et al. discloses a method comprising applying a first organic n- or p-conductive semiconductor layer to a first electrode, the first organic semiconductor layer having a first conductivity (col 7, lines 23-28; Fig. 4a); applying a second organic semiconductor layer to the first organic semiconductor layer (col 7, lines 28-37; Fig. 4b-4c), the second organic semiconductor layer having a second conductivity opposite to the first conductivity, the second organic semiconductor being present in a solvent (col 7, lines 30-33) when applied to the first organic semiconductor layer, the solvent being capable of partially dissolving the first organic semiconductor layer, such that a portion of the first semiconductor mixes with a portion of the second semiconductor to form a bulk heterojunction mixed layer (col 7, lines 51-53); and applying a second electrode opposite the first electrode (col 7, lines 28-30; Fig. 4c).

5. Regarding claim 4, Petritsch et al. discloses a conjugated polymer is used as a donor (col 7, lines 57-58).
6. Claims 6-7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Petritsch et al. (U.S. 6,340,789 B1).
7. Regarding claim 6, Petritsch et al. discloses applying a solution comprising a second organic semiconductor and a solvent on a first layer (col 7, lines 28-33), the first layer comprising a first organic semiconductor that is at least partially soluble in the solvent (col 7, lines 23-28); and evaporating the solvent (col 8, lines 2-4, 18-22) to form a second layer and a bulk heterojunction mixed layer between the first and second layers, the second layer comprising the second organic semiconductor and the bulk heterojunction mixed layer comprising a mixture of the first and second organic semiconductors.
8. Regarding claim 7, Petritsch et al. discloses disposing the first layer on a first electrode before applying the solution (col 7, lines 23-28).
9. Regarding claim 10, Petritsch et al. discloses the first organic semiconductor is a conjugated polymer (col 7, lines 23-28).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petritsch et al. (U.S. 6,340,789 B1) as applied to claims 1 and 6 above respectively, and further in view of Wei et al. (U.S. 5,747,363).

12. Regarding claims 3 and 9, Petritsch et al. discloses that the first and second organic semiconductor layers are deposited by a spin-coating process. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a doctor blading process since the examiner takes Official Notice of the equivalence of spin-coating and doctor blading (see for example, Wei et al., col 5, lines 1-6) for their use in the semiconductor fabrication art and the selection of any of these known equivalent techniques to deposit an organic film would be within the level of ordinary skill in the art.

13. Claims 5 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petritsch et al. (U.S. 6,340,789 B1) as applied to claims 1 and 6 above respectively, and further in view of Brabec et al. ("The influence of materials work function on the open circuit voltage of plastic solar cells").

14. Regarding claims 5 and 11-12, Petritsch et al. discloses an electron acceptor but does not disclose that it is a soluble methanofullerene (col 6, lines 62-65). However, Brabec et al. discloses that bulk heterojunction cells using a soluble methanofullerene (such as PCBM) achieved greater power conversion efficiency (page 368, col 2, lines 1-6). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Petritsch et al. with using a

soluble methanofullerene as the electron acceptor so as to achieve greater power conversion efficiency.

Response to Arguments

15. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reema Patel whose telephone number is 571-270-1436. The examiner can normally be reached on M-F, 8:00-4:30 EST.

Application/Control Number:
10/561,582
Art Unit: 2812

Page 6

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RSP


MICHAEL LEBENTRITT
SUPERVISORY PATENT EXAMINER